

Protocol Questions – definitions

(**Note:** Please be sure to address items in **bold** as these denote areas of **essential** information.)

INDICATOR: Specific indicator

Type: Is the indicator a basic resource component/value, a stressor within the system, or in some cases, both.

Indicator Category: Is the link in the indicator matrix (Table 4a,b)?

Ecosystem(s): Links the indicator to ecosystems within the parks.

Park(s): Identifies what park(s) the indicator is associated with.

Metric(s): Refers to the elements to be measured and the data to be collected.

Method: Provides a short description of a methodology or references a developed protocol. Please include reference to frequency, timing, and scale as described below.

Frequency: Stipulates how often the indicator should be measured.

Timing: Specifies the time of year that data collection should occur.

Scale: (See Figure 3.) Three scales will be identified: 1) indicates at what level the data will be collected in the nested spatial system, 2) on what scale the process or element operates and 3) at what scale can the analysis be inferred.

Monitoring Question(s): Provides justification as to the importance of measuring this indicator. (See Table 2. Management issues and monitoring questions.)

Basic Assumptions: Specifies the underlying assumption(s) that if not true, would possibly invalidate this indicator/methodology.

Research Need(s): Identifies any known research need(s) that would facilitate understanding of how this indicator fits within the ecosystem model.

Management Goal: Desired future condition.

Threshold/ Target Value: Stipulates the resource condition (numerically if possible) and the amount of variation from this condition that will be tolerated (accepted as natural variation).

Management Response: Specifies what management action is recommended if the threshold or target is not met.

Constraints: Lists issues/concerns about the indicator related to its successful implementation.

Status: Identifies whether monitoring is proposed, in development, or on-going.

References: Contacts, experts or literature relevant to the indicator.

INDICATOR: Prairie Falcons

Type: resource value

Indicator Category: Biosphere-faunal characteristics-native species of special interest

Ecosystem(s): terrestrial

Park(s): PINN

Metric(s): territories occupied, successful nests, chicks produced, egg toxicology, number of human non-compliance events and human-raptor interactions

Method: nest survey monitoring, protocol defined in Fesnock and Rehtin 2002

Frequency: every year

Timing: January through fledging (June-August), 1-3 week intervals at each nest

Scale: data collection at I
operates on V
analysis inference on IV (unless combined with data from other monitoring efforts)

Monitoring question(s): Do human recreational activities affect the species?

How are airborne contaminants affecting the species?

Are the species becoming genetically isolated?

species of special concern

Is agriculture on surrounding lands impacting the species?

Basic Assumptions: threshold response to disturbance and PINN is a source population

Research Needs: radio telemetry project to figure out where they eat and go in winter (on-going)

Management Goal(s): maintain population level
maintain chick production at a "source" level
reduce human-raptor interactions

Threshold/Target Value(s): in any given year, < 6 territories nest
in two subsequent years, less than < 8 territories nest
in two subsequent year, average chick production ≥ 2.4 chicks/nest
declining trend for 3 years, not source chicks for more than 2 years

Management Response:

If data indicates the decrease in population related to human disturbance, upgrade advisory closures to mandatory closures and increase public education efforts.

If data does not indicate recreational human use as the likely cause, consult with other agencies with prairie falcon populations to determine if population declining overall or just locally, follow with initiating research.

If data indicates increased egg toxicity or if consultation with other agencies indicate statewide problem, initiate research.

Constraints: Does this have a good cost/benefit ratio?
There is a lot of "noise" in the data, lots of natural variability, want to make sure that a single year of low territory occupancy is not evaluated as a decline.
to make the most out of data collected, requires other agencies to be doing research near by and ancillary research within the monument

Status: on-going, initiated in 1988

References: Fesnock and Rehtin 2002

INDICATOR: Ground Water

Type: resource value and stressor

Indicator Category: Hydrosphere

Ecosystem(s): terrestrial, wetland

Park(s): All

Metric(s): spring and surface water flow (volume/time), pattern of surface water drying, depth of ground water (well data), pumping rates (in park and out of park if possible)

Method: deploy pisometers and use existing wells for ground water measurements, visual observation and mapping of surface water drying, flow rates, protocols to be developed

Frequency: annually

Timing: water flow: varies weekly to quarterly, well data: monthly water drying: twice in summer

Scale: data collection I to IV
operates on III to IV
analysis inference on IV

Monitoring Questions: Does development in and around the parks decrease water in the park's aquifers and impact riparian habitat and riparian wildlife species?

Are there pollutants in the ground water?

Basic Assumptions: linear disturbance response and needs hydrologic model for cause-effect analysis

Research Needs: will need a hydrologic model and a map of aquifers

Management Goal(s): reduce (or maintain) ground water withdrawal (at the 1960's level)

maintain a sustainable ground water use which allows surface water amounts to approximate historic conditions (the 1960's)

Threshold/Target Value: no declining ground water levels, plus restoration of historic ground water levels, specific numbers need to be developed with the hydrologic model to better understand negative trend

Management Response: reduce ground water withdrawal inside park
encourage adjacent landowners to reduce groundwater withdraws
coordinate with CDWR to ensure Monument's water rights
educate public on water issues and promote sustainable resource.

Constraints: need about 10 years of data to understand natural variation (La Nina and El Nino events)
need about 10 years of data to understand surface water drying
ground water modeling is very complex and difficult
ability to effect outside impacts to the aquifer

Status: proposed, initial inventory of stream and spring flows

References:

INDICATOR: Small Bird Counts

Type: resource value

Indicator Category: Biosphere-faunal characteristics-species richness and diversity

Ecosystem(s): terrestrial, wetland

Park(s): All

Metric(s): relative species number at specific points, species presence/absence %

Method: variable circle plots (protocol developed by PRBO, CJ Ralph, and others)

Frequency: 3 consecutive years every five years

Timing: breeding (May to July) and wintering (November to January) seasons

Scale: data collection at II
analysis at IV
inference at IV

Monitoring Questions: Is habitat quality and ecosystem function changing? Is global climate change affecting bird productivity? Is grazing affecting species diversity?

Basic Assumptions: Assumes geographic expansion/contraction to be of value and population dynamics may be dependent on other areas used in the birds annual cycle.

Research Needs: What are baseline diseases in passerine populations.

Management Objective: Maintain bird populations (relative abundance ranking is “stable”, species percent plots occurrence (of the most common species) is “stable.”

Threshold/Target Value: relative abundance ranking changes 3 or more positions for 4 of the top 15 species
percent of plots (for top 15 species) changes more than 50% between survey years

Management Response: Initiate research to determine declines.

Constraints: Consider resident species (winter) versus just breeding, technique is not robust for rare bird species.

Status: In development (inventory complete, first set of monitoring complete) for PINN, JOMU, EUON. 10 years of monitoring in riparian habitat at MUWO, GOGA and PORE. 35 years of monitoring in coastal scrub at PORE.

References: Ralph et al. 1993. Numerous PRBO studies in all parks.

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INDICATOR:

Type:

Indicator Category:

Ecosystem(s):

Park(s):

Metric(s):

Method(s) (include frequency, timing, scale):

Monitoring Question(s):

Basic Assumptions:

Research Need(s):

Management Goal:

Threshold/Target Value:

Management Response:

Constraints:

Status:

References: